

HP StorageWorks

Business Copy EVA

administrator guide

This guide describes the administration of HP StorageWorks Business Copy (local replication) features on HP StorageWorks Enterprise Virtual Arrays.

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HP StorageWorks Business Copy EVA Administrator Guide

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About this guide

This guide describes the administration of HP Business Copy (local replication) on HP StorageWorks Enterprise Virtual Arrays.

Intended audience

This guide is intended for managers, supervisors, administrators and operators of storage area networks (SANs) that include HP StorageWorks Enterprise Virtual Arrays.

Prerequisites

Readers should be familiar with the administration of SANs and local area networks.

Related documentation

In addition to this guide, please refer to:

- *HP StorageWorks Replication Solutions Manager administrator guide*
- *HP StorageWorks Business Copy EVA/MA/EMA network administration guide*
- *HP StorageWorks EVA software compatibility reference*


These and other HP Business Copy EVA guides can be found at the product web site:
<http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html>


Document conventions and symbols

Table 1 Document conventions

Convention	Element
Medium blue text: Figure 1	Cross-reference links and e-mail addresses
Medium blue, underlined text (http://www.hp.com)	Web site addresses
Bold font	<ul style="list-style-type: none">• Key names• Text typed into a GUI element, such as into a box• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
<i>Italics font</i>	Text emphasis
Monospace font	<ul style="list-style-type: none">• File and directory names• System output• Code• Text typed at the command-line
<i>Monospace, italic font</i>	<ul style="list-style-type: none">• Code variables• Command-line variables
Monospace, bold font	Emphasis of file and directory names, system output, code, and text typed at the command line

△ **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or data.

 **IMPORTANT:** Provides clarifying information or specific instructions.

 **NOTE:** Provides additional information.

 **TIP:** Provides helpful hints and shortcuts.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP support web site:

<http://www.hp.com/support/>.

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

For continuous quality improvement, calls may be recorded or monitored.

HP strongly recommends that customers sign up online using the Subscriber's choice web site at

<http://www.hp.com/go/e-updates>.

- Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, and firmware documentation updates as well as instant access to numerous other product resources.
- After signing up, you can quickly locate your products by selecting **Business support** and then **Storage** under Product Category.

HP-authorized reseller

For the name of your nearest HP-authorized reseller:

- In the United States, call 1-800-345-1518.
- Elsewhere, visit the HP web site: <http://www.hp.com>. Then click **Contact HP** to find locations and telephone numbers.

Helpful web sites

For other product information, see the following HP web sites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- <http://www.hp.com/support/>
- <http://www.docs.hp.com>

1 About HP StorageWorks Business Copy EVA

HP StorageWorks Business Copy EVA (hereafter referred to as local replication) is the HP product name for licensed local replication features on HP StorageWorks Enterprise Virtual Arrays. This chapter describes basic aspects of the product.

Local replication

Local replication allows you to quickly create local, point-in-time copies known as snapclones and snapshots.

Snapclones

A snapclone is an independent, point-in-time copy (replica) of a virtual disk. The replica is created as a fully allocated snapshot and, over time, becomes an independent virtual disk.

Snapshots

A snapshot is a virtual point-in-time copy (replica) of a virtual disk. Snapshots save space by copying point-in-time data only when it changes on the source. A snapshot always depends on the source virtual disk.

Snapshots can be demand allocated or fully allocated. A demand-allocated snapshot is a point-in-time copy in which the allocated disk space can change on demand from an initial minimum up to the capacity of the source at the moment of replication. A fully allocated snapshot is a virtual copy in which the allocated disk space is fixed at the capacity of the source at the moment of replication.

Features and firmware versions

Local replication features vary with the firmware version. Thus, to administer local replication in a SAN, you must know the firmware version on each array. Local replication is automatically installed with the array firmware.

Licensing requirement

To enable local replication features on a given array, you must purchase an HP StorageWorks Business Copy EVA license-to-use (LTU) for that array. When you purchase a local replication LTU, HP provides an electronic license key, which you install using HP StorageWorks Command View EVA.

For more information, see [Managing local replication licenses](#), page 13.

If you do not need local replication on a given array, you do not need a local replication license for the array.

Storage management software requirement

To use local replication in a SAN, at least one installation of HP Command View EVA is required. A single installation can manage all EVA arrays in a SAN.

Supporting products and interfaces

Several HP StorageWorks products and interfaces provide local replication on HP StorageWorks arrays.

HP StorageWorks Command View EVA

This product is required. You cannot use local replication without installing this product.

- Interface: Browser-based graphical user interface
- EVA device management software that creates snapclones and snapshots from a graphical user interface
- Replicates by specifying an array and virtual disk (LUN); cannot replicate by specifying a host and host volume
- Does not provide dynamic mounting or host interaction
- No jobs, job templates, or scripting capabilities

HP StorageWorks Replication Solutions Manager

This optional product provides additional capabilities and benefits.

- Interface: Browser-based graphical user interface and host command line
- Specialized storage replication software that supports both local replication and remote replication.
- Creates snapclones and snapshots using a graphical user interface, jobs, and a command line user interface.
- Replicates by specifying an array and virtual disk (LUN) or by specifying a host and host volume.
- Performs dynamic mounting and interacts with hosts.
- Includes integrated job editor, job templates and job scripting capabilities.
- Includes integrated job management

HP StorageWorks Business Copy EVA/MA/EMA

This optional product provides additional capabilities and benefits for MA and EMA arrays. HP Replication Solutions Manager replaces this product for EVA arrays.

HP StorageWorks DButil

This product is generally optional. Although you can use local replication without it, the product is required when using local replication with an active Microsoft SQL Server 2000 database.

- Interface: Host command line
- Places SQL Server 2000 database in a consistent transactional state and then suspends and resumes write activity when making a snapclone or snapshot
- Suspends writes to the database for the duration of the replication operation
- Supports scripts that can be integrated into batch files to automate these processes

HP StorageWorks Storage System Scripting Utility (SSSU)

This optional product provides additional capabilities and benefits.

- Interface: Host command line
- EVA host platform software that creates snapclones and snapshots from a command line or custom script.
See copy and snapshot commands in the *HP StorageWorks Storage System Scripting Utility reference*
- Replicates by specifying an array and virtual disk; cannot replicate by specifying host and host volume
- Accomplishes dynamic mounting and host interactions by custom scripts

HP OpenView Storage Data Protector

This optional product provides additional capabilities and benefits.

- Interface: graphical user interface
- Automates tasks and provides instant recovery using HP Data Protector extensions for EVA arrays
- Executes snapshots using a an HP Data Protector agent to communicate with HP Command View EVA

HP StorageWorks Fast Recovery Solutions

This optional product provides additional capabilities and benefits.

- Interface: graphical user interface
- Provides fast recovery when Microsoft Exchange 2000 and SQL 2000 databases are damaged
- Requires use of a local replication interface to create one or two copies of production databases

HP StorageWorks SMI-S interface for HP Command View EVA

This optional product provides additional capabilities and benefits.

- Interface: WEBM client-server using XML
- Provides an SMI-S-compliant interface for HP StorageWorks Command View EVA

Typical environment

In a typical environment, a management server is running HP Command View EVA and local replication software, for example, HP StorageWorks Replication Solutions Manager.

The management server is connected by LAN to multiple hosts running replication manager host agents. These hosts contain production database and backup applications that perform I/O on multiple storage arrays in the SAN. An administrator or operator automates replication tasks by running jobs from a browsing computer, a scheduler, or from a host using the replication manager command line interface.

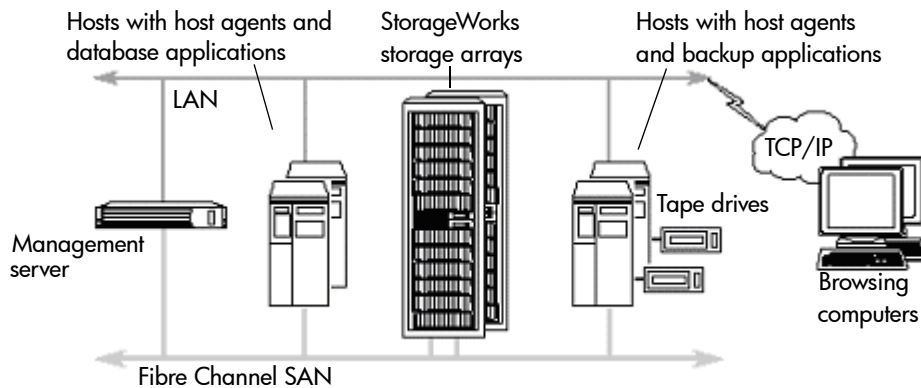


Figure 1 Typical local replication environment

In this environment, replication manager jobs can perform simultaneous nondisruptive tape backups of the databases. To run daily backups, for example, an administrator might create two jobs, each performing the following steps with its respective storage array and host:

1. Momentarily suspend host application I/O to the array.
2. Make an instantaneous snapclone or snapshot of the database on the array.
3. Immediately resume host application I/O to the array.
4. Dynamically mount the snapclone or snapshot on a host for tape backup.
5. Launch a tape backup and wait for completion of the backup.
6. On completion of the backup, reverse the operations and unmount the snapclone or snapshot; then delete it from the array and return the disk space to general use.

2 Planning and best practices

Planning local replication in new SANs

If you have more than one SAN or site, apply the following planning steps to each.

Step 1. Meeting license requirements

Determine the specific arrays in your SAN that need local replication. You need to obtain local replication licenses for only these arrays.

Determine the license requirements for each array. See ["Managing local replication licenses"](#) on page 13.

Step 2. Choosing interfaces

HP Command View EVA is required and HP Storage System Scripting Utility comes with the array. Choose other graphical and/or command line interfaces that you will use for replication tasks. See ["Supporting products and interfaces"](#) on page 8 to match interface capabilities with your needs.

Step 3. List requirements

Use [Table 2](#) to record the local replication licenses and interfaces that you need.

Table 2 HP StorageWorks local replication planning worksheet

Local replication components		Quantity	Notes
Required			
HP StorageWorks Business Copy license (LTU)	1 per array		
Optional			
HP StorageWorks Replication Solutions Manager	1 per SAN		
HP StorageWorks Business Copy EVA/MA/EMA	1 per SAN		
HP StorageWorks SSSU	varies		
HP StorageWorks DButil	varies		
HP OpenView Storage Data Protector	1 per SAN		
HP StorageWorks Fast Recovery Solutions	1 per SAN		
HP StorageWorks SMI-S Interface for HP Command View EVA	1 per instance of HP Command View EVA		

Planning local replication upgrades

Replication components have many dependencies and relationships to other SAN components. For supported versions of related products, see *HP StorageWorks EVA software compatibility reference* on the HP StorageWorks Business Copy EVA web site. When planning upgrades, consider the following:

Interface versions

Before upgrading a local replication interface, ensure that the interface prerequisites are met. There may be compatibility requirements for management servers, hosts, and browsing computers.

Hosts

If replication host agents are installed, ensure that the update is compatible with the host agent and other applications on the host. Some typical issues include:

- Operating system type and version
- File system types
- Logical volume manager type and version
- Cluster software type and version
- Fibre Channel HBA type and driver version
- Multipath software type and version

Browsing computers

When updating browsing computers, ensure compatibility with HP Command View EVA and other local replication software. Some typical compatibility issues include:

- Operating system type and version
- Browser type and version
- JRE type and version

SANs with MA/EMA arrays

If you are using HP StorageWorks Business Copy EVA/MA/EMA for local replication on EVA and MA/EMA arrays, consider MA/EMA compatibility when upgrading.

Managing local replication licenses

To perform local replication (create snapclones and snapshots), an HP StorageWorks array must have a valid local replication license. This replication license is also known as a license-to-use, or LTU.

Determining required LTUs

For each array, estimate the source storage space (in TB) to be locally replicated, regardless of the Vraid level. This space is called the array's replicated capacity. For each array, provide HP Business Copy EVA LTUs that equal or exceed the amount of replicated space.

Source replicated capacity is different (less) than the total (or raw) capacity of an array. The total capacity of an array is the sum of the raw capacities of the individual disk drives in the array, regardless of the Vraid level.

You can make and retain multiple snapshots and snapclones, even if the aggregate space for the copies exceeds the source space. The LTU covers the source capacity being replicated. You can make and retain as many copies as space on the array allows.

Example 1. Assume that you have 1.5 TB of source volumes on an array that requires local replication. This array requires LTUs that equal or exceed 1.5 TB. This can be achieved through two 1-TB LTUs, or a single unlimited LTU.

Example 2. Assume that you do not know in advance the amount of source space that requires local replication, but believe it to be less than 1 TB. This array requires at least a minimum (1-TB) LTU to perform local replication. If you need to license more replicated capacity later, you can upgrade to an unlimited LTU for the array.

Example 3. Assume that an array has a total capacity of 10 TB. You do not know in advance the amount of source space that requires local replication, but believe it to be more than 1 TB. In this case, an unlimited LTU would be best.

Verifying licensed arrays

1. Browse to the HP Command View EVA interface
2. Select **Agent Options > Licensing Options > View Previously Entered License Keys**.
The View License Key window appears.
3. Review the list and look for entries like `FEATURE HSV11x-SNAPSHOT`. Reference to the snapshot feature indicates that the array is licensed for local replication.

Installing replication license keys

You install local replication license keys using the HP Command View EVA interface. Documentation for installing replication license keys is included in the license kits that you receive.

Managing replication activities

Develop operational guidelines and best practices to manage the following.

Simultaneous replication operations

Minimize the number of replication requests to the same array at the same time. Too many simultaneous local replication events can reduce array performance.

Avoid making simultaneous multiple replication requests to the same virtual disk. Multiple replication operations on the same virtual disk not only slow performance, but in the case of automated jobs, can lead to job failures. For example, if the maximum number of snapshots per virtual disk is exceeded when the job is running, the job will fail.

Do not run two or more simultaneous jobs that interact with the same host. If possible, design a single job that includes the combined tasks of the separate jobs. When scheduling replication jobs, consider the timing relative to other jobs on the same array, host, or management server. Tune and balance demands to maximize performance.

Snapshot and snapclone rules

When a local replication interface indicates that a storage volume (virtual disk) does not support replication, or if a script fails in a replication job, one of the following rules has probably been violated.

Snapshot rules

- All snapshots of a given virtual disk must have the same allocation policy
- No more than seven snapshots of a given virtual disk can exist at one time
- When managing array resources, snapshots are counted as a virtual disks.
- Snapshots must be created in the same disk group and disk family as the source disk.

Snapclone rules

- Snapclones are created in the same disk group as the source by default but can be created in another disk group.
- Snapclone cannot be created if the source has a snapshot.

Common snapshot and snapclone rules

Neither snapshots nor snapclones can be created when the source:

- Is itself a snapshot
- Is unsharing or being deleted

Job dependencies

Avoid changing storage and host configurations while replication jobs are running. For example, do not change an array configuration using HP Command View EVA while the replication manager is running jobs. Changing resources can lead to job failures and require manual intervention to restore resources to operational readiness.

Ensure that planned downtime for hosts is coordinated with replication jobs. A job will fail if a referenced host is unavailable when the job is run.

Ensure that planned management server shutdowns are coordinated. Stopping a management server:

- Stops any local replication applications on the server
- Causes running jobs to fail
- Prevents scheduled jobs from starting

Ensure that network connections between a management server and host agents are maintained, especially while jobs are running. Jobs that interact with hosts fail if the network connection is not maintained throughout the job.

Network configuration changes

If possible, avoid changing the network identification (computer network name or IP address) of a management server or the computers where replication host agents are running.

- **Server identification change** - If identification of a management server changes, you must use documented procedures to update all associated replication host agents so they can communicate with the management server. If the local replication host agents are not updated to reflect the new management server identification, jobs that involve the host will fail.
- **Host agent identification change** - If identification of a replication host agent is changes, you must update impacted replication jobs so the jobs provide the correct references to hosts. If the impacted jobs are not updated to reflect the new host agent identification, the jobs will fail.

Backup

HP recommends that you back up replication jobs and configurations regularly using the save and restore features of your local replication products. This ensures that job and configuration data can be easily restored during planned or unplanned maintenance of the management server.

HP recommends that you make installation and archive CD-ROMs of local replication files that you download from the HP web site. Making copies of download files ensures that you can quickly restore a management server and replication host agents to a given version without repeating download procedures.

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